format. Local broadcasters and ad supported cable channels may take longer before they deliver programs in the high definition format.

Video Compression: The purpose of video compression is to achieve more efficient use of expensive bandwidth and power. Currently, each television channel on a cable system occupies 6 MHz of spectrum space which is the same amount of bandwidth as a broadcast television channel. Hence the number of channels that a cable system can deliver to subscribers at any one time is limited by the bandwidth of the system. For example, an operator may carry 60 channels in a 450 MHz system and 76 channels in a 550 MHz system.

In the future, the use of video compression would permit a greater number of channels to be transmitted in a given bandwidth. For example, a cable operator might dedicate four standard TV channels (24 MHz of bandwidth) to services to be delivered in a compressed mode. The compression technology might accommodate 8 to 12 video signals in this bandwidth. Hence, viewers would have four to eight additional program choices available to them.

Digital Storage and Switching: One of the major elements of an interactive services delivery system will be the amount of digital storage and switching technology installed at or accessible to either a cable headend or a telephone switching office. Interactive services will require capabilities that are new both to cable headends and telephone switching centers. Historically, cable headends do not have any significant switching requirements and telephone central offices do not handle television services. Digital technology is beginning to place increased demands on each of these facilities as the role of cable operators and telephone companies change. A major new element that is common to most interactive experiments is a file server, which can store gigabytes of information in a digital format. This information could include movies in a compressed video format, games that could be played simultaneously by several

customers of a service, or data bases for use by local subscribers. The economics and marketing requirements of how file servers will be used should be clarified by these experiments.

These technological breakthroughs, with existing digital technology, threaten to revolutionize home entertainment and services, education, and professional and business procedures in the nineties. Interactive or two-way cable television is likely to become commonplace as it proves to be increasingly cost efficient in linking schools for special courses like it does in Enfield, Connecticut, connecting hospitals for training and videoconferences as it does at Portland, Oregon, providing municipal fire, police, prison, and utilities with discreet video connections as it does in many communities or providing data transmission for businesses as it does in New York City; Dearborn, Michigan; Kansas City; and elsewhere.

Competition

As these technological developments occur, dramatically altering the way households, businesses, and schools "connect" with informational, educational, entertainment, telecommunications and transactional services, the competitive dynamics of the industry change. Today cable faces competition from a wide variety of sources of entertainment, including over-the-air broadcasts (which are free) and video tape rentals (which are inexpensive and do not require a monthly commitment from the customers). Future competition for cable operators is expected to come from three industries offering similar video product directly to the home: direct broadcast satellite services, telephone companies, and wireless cable. It appears that all three competitors are adequately financed to compete with cable operators.

DBS. Direct Broadcast Satellite, is a satellite-to-home service utilizing a "backyard dish" or receiver. Currently, most DBS customers are in lightly populated rural areas

which are not served by cable companies due to cable's self-imposed guidelines for "cost-effective" densities of 20-30 households per mile.

In late June 1994, G. M. Hughes Electronics and U.S. Satellite Broadcasting ("USSB") began offering a DBS system in five markets utilizing high-tech, high cost Ku-Band satellites for multichannel reception. The Hughes/USSB system (DirecTV) is expected to be available nationally by the end of 1994.

PrimeStar, a direct satellite broadcast system owned by several cable operators and financial partners also began service in June 1994 with 70 channels in the first all digital television signal delivery system.

Advantages of DBS to consumers are the prospect of satellite signals at competitive monthly prices and additional program services (Hughes may offer 50-80 channels of pay-per-view movies). Disadvantages are requirements for an unimpeded line of sight for the receiver, a high initial cost to subscribers (approximately $700 for a single TV set, $900 for two, plus installation fees up to $150), no carriage of local broadcast signals or locally originated programming, and currently the inability to provide practical interactive services.

Wireless. Wireless cable (also referred to as multichannel multipoint distribution system, "MMDS") provides multichannel television service via a local microwave distribution system and microwave receive equipment at the consumer location. Wireless requires less capital than cable, is easier to construct, and provides service to an area faster than it takes to build a cable system. Disadvantages include line of sight, interactivity and local content limitations, similar to those stated above for DBS. Also, there are current limitations to a maximum of 33 channels of capacity. Even so, some current wireless operators claim an "unlimited market" in United States cities, with an average of 10% take-away of subscribers from cable.

Telephone Companies. When talking about cable competition, "telephone" usually means Regional Bell Operating Companies (RBOCs), because their lobbying and public campaign for rights to provide video in their service areas has been highly visible. Telephone companies view cable as a great new source of revenue and a way to finance fiber optic cable throughout their areas. While regulatory and legal questions remain, the RBOCs march towards video in their service areas seems unstoppable in the near term -- 1995 or 1996. Already, RBOC's have filed 20 separate applications for approval to build video dial-tone systems to enable them to build transport systems and sell transmission capacity to video program operators. The U.S. District Court for the Eastern District of Virginia in 1993 held for Bell Atlantic that the cross-ownership provisions of the 1984 Cable Television Act barring RBOC's from providing cable in their service areas were unconstitutional (now on appeal). US West has recently received a similar ruling. The RBOCs have the financial resources, technical expertise and consumer experience to be strong competitive threats to traditional cable television operators.

Conclusion

The factors noted above create a situation in which cable operators may have a limited time during which their actual investments in building and developing the nation's video telecommunications infrastructure can likely be recovered from the traditional regulated cable services that are responsible for the bulk of those investments having been incurred. As a result, it is all the more important for regulatory authorities to fully understand and fairly accommodate the existence of ARD as a significant element of the investment cable operators have made in the video telecommunications infrastructure.

PART III - DATA COLLECTION METHODOLOGY

Kane Reece, under strict assurances of confidentiality of individual System data, obtained detailed income statements and balance sheets for annual periods since inception of cable system operation (or availability of records) through year end 1993. Current and historical subscriber counts were also obtained. We also collected current (December 31, 1993) and historical (as available) channel line-ups for use in allocating costs between regulated and non-regulated services. Historical channel line-up data proved quite difficult data to collect. As a result, Kane Reece used the current year end 1993 channel line-up for each System to be representative of the channel mix between regulated and non-regulated services historically. This channel mix factor allocated expenses after directly identifiable items, such as programming expenses, pay-per-view expenses, etc. were assigned to the appropriate category of regulated versus non-regulated. The use of a simple channel count as an allocator is conservative, because it ignores the well-established fact of the cable business that only a fraction of customers subscribe to services other than basic/expanded basic (see Table 2). The use of the current channel mix is especially conservative, because non-regulated (pay) service channel offerings were, in general, a lower percentage of total service offerings in earlier years.

Kane Reece then tracked ongoing net cumulative "original cost" investment in physical plant and losses/(profits) in earnings each year i.e., "return deficiency" (or retained earnings). In order to derive a pro forma "regulated" earnings value, we adjusted the reported net profits by removing actual interest expense contained in retained earnings and substituting an "allowable" 11.25% return on average net investment. We also eliminated from net profits any non-recurring items (such as gain/loss on sale of assets), as well as non-operational items. We then derived a per subscriber ARD

"value" each year and determined the average number of years until the ARD becomes positive ("break-even") cumulatively (if ever).

Since the current cost-of-service rules stipulate an allowable rate of return equal to 11.25%, Kane Reece calculated the ARD value by applying this return factor to the sum of the average net allocated regulated investment in plant and equipment and the prior year cumulative pro forma retained earnings or deficit. (This latter calculation is needed to reflect the cost of money over time.) This has been added to annual book operating losses/(profits) to determine the annual ARD.

PART IV - ARD CALCULATION DESCRIPTION

The calculation for the ARD analysis (Exhibits A through E) was completed on an after-tax rate of return ("ROR") basis of 11.25%.

This rate of return factor has conservatively assumed no "gross-up" provision for taxes and has been applied to total cumulative invested capital on an annual basis to derive the pro forma allowable regulated return.

Table 3 is a sample input form from one of the Systems included in the analysis. Similarly, Table 4 provides a summary of the output section of the ARD model for several sample years of data. Total regulated revenue (Line 1) is established in Table 3's input section. Operating expenses are allocated either directly, based on the ratio of regulated to total channels, or based on the ratio of regulated to total revenue as indicated in the input section.

Interest expense, when provided, is indicated in order to back this cost out of net income and allow for the regulated rate of return factor discussed above. Net income is calculated after book depreciation and amortization (non-acquisition related intangibles only).

Gross long term assets represents original cost of plant and equipment along with construction in progress ("CIP") and equipment inventory assets. Net long term assets deducts cumulative depreciation and amortization and when added to the accumulated return deficiency (Line 13) forms the cumulative invested capital (Line 14).

TABLE 3

ACCUMULATED RETURN DEFICIENCY
SAMPLE INPUT SECTION

	Years: 1979	1989	1990	1991	1992	1993	NOTE:
I. INPUT SECTION - FINANCIAL DATA							
1	Total Revenue	$15,522,031	$17,046,343	$18,642,015	$19,578,551	$20,760,900	THIS IS AN EXCERPT
2	Guides			11,634	19,211	25,724	FROM A SAMPLE SYST.
3	Other Non-Regulated Revenue	293,724	597,287	618,250	1,159,890	1,172,405	& MERELY DIDPLAYS
4	Pay Revenue	4,498,967	4,463,594	4,808,448	4,323,629	4,119,294	SEVERAL RECENT YEARS OF DATA, NOT
5	Regulated Revenue	$10,729,340	$11,985,462	$13,203,683	$14,075,621	$15,443,477	DATA FROM SYSTEM INCEPTION
6	Operating Expenses	1,886,330	1,925,429	2,042,970	2,215,097	2,251,507	
7	G&A Expenses	2,392,432	2,483,155	2,679,694	2,949,076	2,585,283	
8	Bad Debt	290,060	352,393	371,336	293,700	349,559	
9	Collection Exp	58,445	(80,860)	(88,421)	163,276	186,626	
10	Franchise Fees	748,359	811,654	881,710	921,048	980,309	
11	Marketing Expenses	1,443,754	1,629,184	1,566,885	1,576,337	1,416,725	
12	Guides	3,258	2,911	40,135	30,077	29,220	
13	Advertising Expense	204,621	248,608	327,231	380,082	347,313	
14	I/O Expense	634,598	729,829	772,131	1,111,004	1,408,980	
15	Regulated Programming Expenses	777,989	1,067,201	1,287,487	1,398,896	1,834,724	
16	Pay Programming Expenses	2,435,434	2,590,054	2,959,950	2,570,102	1,996,618	
17	Total Expenses	10,875,280	11,759,558	12,841,108	13,608,695	13,386,864	
18	Operating Income(Loss)	4,646,751	5,286,785	5,800,907	5,969,856	7,374,036	(Line 1-Line 17)
19	Interest Expense	3,799,363	4,188,810	3,699,372	3,845,000	2,404,022	
20	Depreciation & Amortization	3,598,804	3,614,725	3,565,833	3,941,954	3,582,137	
21	Net Income(Loss)	($2,751,416)	($2,516,750)	($1,464,298)	($1,817,098)	$1,387,877	(Line 18-Lines 19 & 20)
22	Total LT Assets	$42,348,626	$43,749,346	$44,906,647	$46,416,842	$47,738,490	
23	LO Equipment	2,367,582	2,429,469	2,477,871	3,008,871	3,638,660	
24	Converters/Remotes/ Other Direct Reg Assets	7,667,452	7,951,040	8,398,918	8,631,756	8,727,074	
25	Direct Non-Regulated Assets						
26	Other LT Assets	$32,313,592	$33,368,837	$34,029,858	$34,776,215	$35,372,756	
27	Total Accum. Depreciation & Amortization	$11,847,920	$15,381,914	$18,839,632	$22,593,518	$24,372,650	
28	LO Equipment	1,097,715	1,418,578	1,606,898	1,940,393	2,272,184	
29	Converters/Remotes/ Other Direct Reg Assets	3,259,553	4,202,823	5,134,231	6,158,941	7,201,530	
30	Direct Non-Regulated Assets						
31	Other Accum. Depreciation & Amortization	$7,490,652	$9,760,513	$12,098,503	$14,494,184	$14,898,936	
II. INPUT SECTION - OTHER INFORMATION							
32	Ending Basic Subscribers	45,894	46,332	45,944	46,612	47,063	
33	Ending Homes Passed						
34	Plant Miles						
	Channel Allocation Channel Line-up						
35	Regulated % 83.90%					83.90%	
36	Non-Reg. % 16.10%					16.10%	

TABLE 4
ACCUMULATED RETURN DEFICIENCY
SAMPLE OUTPUT SECTION - SUMMARY

ALLOCATED REGULATED SERVICE ARD:	1979	1989	1990	1991	1992	1993	Notes
1 Total Revenue		$10,729,340	$11,985,462	$13,203,683	$14,075,621	$15,443,477	
2 Operating Expenses		6,482,534	7,072,024	7,630,251	8,621,513	9,138,213	
3 Operating Income(Loss)		4,246,806	4,913,438	5,573,432	5,454,108	6,305,264	
4 Interest Expense		3,332,615	3,674,428	3,248,032	3,381,202	2,016,974	
5 Depreciation & Amortization		3,156,694	3,170,840	3,130,786	3,466,461	3,005,413	
6 Net Income(Loss)		($2,242,503)	($1,931,830)	($805,386)	($1,393,555)	$1,282,877	
7 Total Gross LT Assets		$37,146,138	$38,376,963	$39,427,840	$40,817,871	$42,043,476	
8 Total Depreciation & Amortization		10,641,925	13,810,471	16,891,773	20,259,954	21,973,921	
9 Net LT Assets		$26,504,213	$24,566,492	$22,536,067	$20,557,917	$20,069,555	
DERIVATION OF CUMULATIVE INVESTED CAPITAL:							
Invested Capital:							
10 LT Assets-Net Beg. of Yr.		$27,809,341	$26,504,213	$24,566,492	$22,536,067	$20,557,917	Line 9, Prior Yr.
11 LT Assets-Net End of Yr.		26,504,213	24,566,492	22,536,067	20,557,917	20,069,555	Line 9, Curr. Yr.
12 Average LT Assets for the Yr.		27,156,777	25,535,352	23,551,279	21,546,992	20,313,736	Line (10+11)/2
13 Accumulated Return Def.		18,039,021	22,033,437	25,642,327	28,733,962	32,402,922	Line 19, Prior Yr.
14 Cumulative Invested Capital		$45,195,798	$47,568,789	$49,193,607	$50,280,954	$52,716,658	Line 12 + 13
CALCULATION OF DEFICIENCY:							
15 Allowable Return (11.25%) of Invested Capital		$5,084,527	$5,351,489	$5,534,281	$5,656,607	$5,930,624	Line 14 x AFTX ROR
16 Add: Net Loss (Bef. Interest)		0	0	0	0	0	Line 4 + 6
17 Less: Net Income (Bef. Interest)		(1,090,112)	(1,742,598)	(2,442,646)	(1,987,647)	(3,299,852)	Line 4 + 6
18 Deficiency for the Year		$3,994,416	$3,608,891	$3,091,635	$3,668,961	$2,630,773	Line 15 + 16 + 17
19 **Accumulated Return Def. (EOY)**		$22,033,437	$25,642,327	$28,733,962	$32,402,922	$35,033,695	Line 19, Cumulative
Per Subscriber (cumulative)		480	553	625	695	744	

Hypothetical Sale Analysis:

Sales Price @ 10 X Op. Cash Flow	73,740,360	
Effective per Subscriber Multiple	1,567	
Tangible net Assets	32,839,554	
Intangible Assets	40,900,806	(55% Percent of Sales Price)
Allocated regulated intangible assets	34,315,776	
ARD as % reg'ld intangible assets	102.1%	

The rate of return factor is then applied to the average net invested regulated capital to derive the allowable return. Then the net income/(loss) on Line 6, before interest expense, is added to the allowable return, to calculate the deficiency/(surplus) for each respective year (Line 18). These annual values are then accumulated on Line 19 and calculated on a per subscriber basis.

Finally, we calculated a hypothetical sales price for each System based on an average operating cash flow multiple of ten times. We tested the reasonableness of this approach by examining a data base of announced cable TV system sales for 1993 (as published in the *Cable TV Investor*, 1993 and the *Cable TV Financial Databook*, 1994 both published by Paul Kagan Associates, Inc.). We also checked the 1993 per subscriber multiple, which is a less precise indicator of value in the industry, but one that is often quoted in the press. We have concluded that the systems included in the study are reasonable representations of the cable TV industry. We then deducted actual 1993 tangible net book assets from the purchase price to arrive at the implied percent that intangible assets would represent in such a hypothetical sale scenario. The intangible assets were then allocated to regulated services based on the 1993 channel allocation factor.

PART V - DISCUSSION OF RESULTS

The following section discusses the results of our study on an exhibit by exhibit basis.

EXHIBIT A

Shows the per-subscriber ARD for each system and on average. This Exhibit is based on project inception year, not calendar year. That is, "Year 1" might be 1981 for one System and 1989 for another System, but, in all cases, reflects the first year of System operation (or first year of data availability). ARD values (adjusted for inflation) range from $292 per subscriber in the initial year of the project to $809 per subscriber in the fourteenth year.

This Exhibit clearly shows the extended period of time over which cable operators must accept losses and low earnings in order to obtain a reasonable return on their investments. Based on the conservative assumptions embodied in the study, it takes an average of 13 years for cable operators to achieve even an 11.25% return on a project life-cycle basis.

The conservatism of the assumptions in the study bears emphasis here. First, the length of the payback period, and the size of the average accumulated ARD in any one year, is directly dependent upon the 11.25% overall return figure. As noted above, in our view this figure is substantially understated today, due to the understatement of the cost of capital of even regulated entities during most of the 1980s and the exclusion of any provision for income taxes in the return factor. Obviously, if a higher and more realistic overall return figure were to be used in the analysis, the size of the ARD and the payback period would both substantially increase.

Second, as noted earlier in this report, our analysis assumes that any System that had not achieved full payback by the end of 1993 did so in 1994 -- which is obviously not true. This assumption, which affected 24 of the 41 sample systems, also dramatically shortens the average payback period.

The ARD phenomenon is particularly apparent when the data in Exhibit A are reviewed in light of the actual calendar years associated with the "Project Year 1" on the table. Systems that were built in the pre-1980 period have lower subscriber counts, lower ARDs, and shorter payback periods than Systems that were built during the 1980s and early 1990s. These older, smaller systems are clearly less relevant to current cost-of-service issues than the remainder of the sample. The fact that the financial performance of pre-1980 systems is notably superior to post-1980 Systems should not be surprising in light of the dramatic changes the cable industry experienced during the 1980s. As discussed in Part II of this report, this was the period during which cable operators were generally called upon to meet "universal service"-type obligations by extending their networks to make cable available to more than 90% of television households, and also a period of intense technological change (including the development of more efficient amplifiers, head-end equipment, and network architectures), leading to significant investment requirements.

The observations regarding pre- and post-1980 Systems also demonstrate that, to the extent that some of the Systems in the sample may have developed negative ARDs (reflecting cumulative earnings above 11.25% for the project), the opportunity to do so relates primarily to the past, and to Systems that are below the average size of our sample. It is, therefore, of limited relevance to the current state of the cable industry or to how cable rates should be set for larger systems on a cost basis today. This is particularly true in light of the rapid pace of technical development, consolidation of systems, and increasing exposure to competition from well-financed entities such as local telephone companies, discussed in Part II of this report.

In this regard, we would note, as an additional element of conservatism, that the average per-subscriber ARD figures on Exhibit A are "straight" averages of the individual system values. We have not generated a "weighted" average ARD (where the logical weighting would be based on the number of subscribers in a system). Had we done so, the fact that the larger Systems tend to have higher ARDs would have led to much higher "average" figures. Because one of the objectives of the study was to develop average ARD figures that could reasonably be applied to any system in the context of a cost-based rate analysis, we have declined to calculate weighted averages.

For all of these reasons, the average ARD figures per subscriber shown on Exhibit A can safely be viewed as a bare ***minimum*** of the amounts that should be included in cable operators' rate bases in a cost-of-service proceeding in which the question of cumulative low earnings (for systems held by original owners) and/or acquisition premiums (which reflect payment to the seller for the ARDs he has accumulated) are at issue.

EXHIBIT B

Exhibit B provides the calculated accumulated return deficiency/(surplus) by calendar/fiscal year for each System in our 41 System sample. Data were collected for Systems beginning as early as 1971, with the majority of the Systems providing data from the beginning of the 1980s through 1993. For reference purposes, the initial year in which data were supplied by each System is noted along with the year of original System build date. The latter date is based either upon input from the System or the *Television & Cable Factbook*. With the exception of three systems, the build date and data inception dates are either equal or close. The values listed in this exhibit track financial performance until the System reaches break-even. Break-even is defined as that period where the cumulative return deficiency equals zero and the System begins earning positive incremental returns.

Page 1 of Exhibit B summarizes the study's findings, indicating that by 1993, twenty-four of the Systems have an ARD value of $922 million or $38 million per System. The maximum ARD value over the analysis period is $994 million with the maximum ARD attributable to any one System equal to $213 million. Dividing the maximum ARD value by the number of basic subscribers in the year that the maximum ARD is reached, results in an average of $518 per subscriber.

The data show that the ARD phenomenon does not abate at year end 1993. Pages 2 and 3 of Exhibit B provide the raw data output from the ARD calculation model. As can be seen, the ARD values continue to grow over time, ranging from an average of $858,000 per System in 1971 to $1.5 million per System in 1981 to $27 million per System in 1991.

The time required to reach the maximum ARD value from the system build date is 9.2 years. Of more significance is the break-even period, which is 12.6 years from system build. This implies that for the 41 System sample, it takes **an average nearly 13 years for a System to earn its allowable pro forma regulated rate of return of 11.25% on a cumulative basis.** As previously noted, this is a conservative break-even period since many Systems (24 of 41 systems) continue to project return deficiencies in 1994 and beyond.

In contrast with these figures, the FCC COS interim rules allow prematurity accounting start-up costs incurred on a maximum of only <u>two</u> years to be incorporated in the rate base. Clearly the FCC's approach ignores the long term nature of investment in the cable TV industry.

EXHIBIT C

Exhibit C is similar to Exhibit A, except that the data are presented on a calendar year, not project year, basis. This illustrates the point, noted in connection with Exhibit A, that smaller ARDs and more rapid achievement of an 11.25% return on the project as a whole are generally reflected in the older, smaller systems.

EXHIBIT D

Exhibit D provides a hypothetical analysis of 1993 total system intangible assets as a percentage of estimated 1993 total system sales price. To develop Exhibit D, we started with 1993 announced transactions reported in *The Cable TV Financial Databook*, June 1994, published by Paul Kagan Associates, Inc. Based on this data source, sales of cable systems occurred at an average of about 10 times leading operating cash flow. The average reflects 100 transactions involving 1.6 million subscribers and $3.3 billion of total value, and can reasonably by viewed as fairly representative of the market for cable systems as of 1993. Certain reported transactions were excluded from calculating the average due to problems in data completeness and comparability.

We next multiplied each system's 1993 operating cash flow (before depreciation/amortization and interest charges) by the average 10-times-cash-flow multiple to determine the expected sales price for each system. Next, we deducted from each system's expected sales price its actual 1993 net tangible plant value, which results in the amount of intangible assets reflected in the expected sales price. Then, we divided each system's total intangible assets into "regulated" and "non-regulated" categories, using the conservative channel allocation method described elsewhere in this report. (This step is needed because our ARD calculations are based entirely on *regulated* operations of the cable systems we analyzed.) Finally, for systems with a positive ARD as of 1993, we determined the percentage of the estimated "regulated" intangibles represented by the ARD.

Becuase Exhibit D represents a "snapshot" of a number of different systems facing different market circumstances and in differenct stages of the investment life cycle, the results on Exhibit D must be interpreted with care. Nonetheless, some interesting results are apparent.

First, on average, 71% of total system value is embodied in intangible assets. This is not surprising as a business matter, but clearly suggests that the FCC's aversion to including intangible assets in cable operators' rate base is at odds with the economic realities of the cable industry.

Second, on average essentially all (99%) of "regulated" intangibles are attributed to the existence of a positive (that is, unrecovered) ARD. This tends to confirm that the losses and low earnings that cable operators endure during the period when ARD is accumulating translate directly into intangible asset value at the time a system is sold. Of course, at different points in a system's investment life-cycle, factors other than ARD may play a greater or lesser role in creating valuable intangible assets for the system.

Third, as expected, there is a fair degree of variation in the individual system figures. Two systems (Nos. 24 and 36) where regulated ARD represents a large multiple of regulated intangible assets deserve special comment. The very high regulated ARD as compared to total regulated intangible assets reflects a situation in which regulated services have been unable to generate sufficient earnings. This situation would arise from large initial investments in regulated services combined with low service revenues, which could, in turn, arise from a conscious marketing strategy to keep rates low, commitments to franchising authorities to do so, or simply low penetration in relationship to the size of the investment required to serve the franchise areas in question. System Nos. 24 and 36 are in fact representative of the largest type of the

nations cable TV systems as measured by the number of subscribers served, the number of homes passed, the quantity of plant miles (incorporating a significant portion of underground plant construction) and channels of service provided. Additionally, these systems have basic subscriber penetrations (relative to homes passed) well below that of the national average which is typical of systems serving relatively unattractive demographic areas. To give additional perspective on the "snapshot" provided by Exhibit D, eliminating the two highest and two lowest ARD percentages results in "regulated" ARD explaining approximately 60% of total regulated intangibles.

The last but not least observation related to Exhibit D is that the 41 systems, for the most part, are typical cable systems. That is, the hypothetical purchase price, cash flow, per subscriber values and the relative percent of net tangible and intangibe asset value for the Systems are all within an expected range and can be explained by their particular classification (large, medium, small; urban, suburban, rural) and the "life cycle" stage they are in relative to their initial build, rebuild, channel offerings, etc. Clearly some of the systems would sell for multiples of cash flow (or per subscriber values) somewhat different from those in Exhibit D. We have deliberately kept the values at a constant average cash flow multiple to simplify the analysis and reinforce the basic premise of the study: intangible assets are a significant portion of a typical CATV system's value and the losses (unrecovered earnings) or ARD contribute substantial value to the intangible assets upon ownership transfer of a CATV system.

EXHIBIT E

Exhibit E provides the basic subscriber year end counts by System by year. The sample ranges from a low 1993 count of 1,100 subscribers to a high count of 212,000 subscribers, with the average at 43,000 subscribers.

EXHIBIT F

Exhibit F provides a list of those cable television companies participating in the ARD study.

In summary, the study provides an adequate sample of the financial performance parameters associated with "original build" cable TV systems. The methodology employed in this analysis has been conservative in all respects. The results clearly indicate that the time horizon for a cable operator to break-even on his investment and earn a minimal regulated rate of return is in excess of a decade. Additionally, the value of the Accumulated Return Deficiency Study ("ARD") developed over time is passed along to a new owner in an acquisition. This ARD value, on a per subscriber basis is significant and represents a large percentage of the purchase price. Denial of incorporation of this intangible asset in the rate base would unfairly penalize the operator by removing the incentive to invest in the industry.

Respectfully submitted,

Kane Reece Assocs

KANE REECE ASSOCIATES, INC.

EXHIBIT A

Cumulative ARD per Basic Subscriber by System Inception Year by System

- Derives per-subscriber ARD values for each System and on average.
- Based on project inception year not calendar year (year one represents each respective System's initial year of available data).

EXHIBIT A

($)

ARD ACCUMULATED RETURN DEFICIENCY STUDY

CUMULATIVE RETURN DEFICIENCY/(SURPLUS) PER BASIC SUBSCRIBER BY SYSTEM "INCEPTION"YEAR BY SYSTEM

System	YEAR: 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	57	19	56	90	112	95	60	20							
2	18	272	248	282	335	311	325	376	410	446	481	521			
3	153	202	286	351	400	466	527	573	578	124	77	39			
4	157	205	329	415	480	553	625	695	744						
5	178	180	255	305	358	393	403	416	380	378	362	323	280		
6	765	181	272	373	470	606	729	814	942	981	1,048	1,131	1,233	1,294	
7	443	643	258	351	468	593	697	808	908	1,030	1,093	1,172	1,232	1,305	
8	223	258	346	377	402	421	416	395	357	306	248				
9	154	268	347	400	447	501	547	579	579	566	570	555	550		
10	240	332	484	635	762	858	963	1,053	1,156	1,233	1,322	1,479			
11	227	41	85	136	169										
12	206	179	228	276	318	355	383	413	428	549	383				
13	168	302	230	234	260	261	204	206	205	178	144	139	116		
14	517	358	407	536	402	441	493	495	478	444	401	333			
15	10	14	27	27	17	4									
16	150	156	196	247	256	267	248	223	189	149	111	67	20		
17	213	188	291	363	419	463	493	536	582	615	654	693			
18	90	95	134	221	348	377	409	452	470	482	495	486	469	449	
19	10	62	79	104	126	140	143	131	98	26					
20	148	201	291	365	438	509	578	644	710	751	768				
21	106	122	180	205	230	258	227	180							
22	111	76	149	140	120	75	5								
23	970	669	625	591	562	468									
24	209	266	531	740	885	989	1,106	1,221	1,367	1,467	1,543				
25	29	22													
26	456	371	299	382	498	694	828								
27	152	238	295	340	388	399	408	385							
28	184	389	590	749											
29	13	109	188	230	342	414	458	493							
30	111	137	140	125	114	131	128	130	145	129	87	34			
31	68	121	167	179	183	170	139	87	20						
32	64	79	111	141	161	151	126	91	49						
33	144	92	74	77	48	14									
34	503	391	313	187	130	72	35	15							
35	110	120	131	148	159	157	128	82	47	27					
36	49	344	531	874	1,221	1,534	1,970	2,333	2,634	2,950	3,242	3,667			
37	140	149	150	146	119	92	49								
38	105	116	97	101	100	93	70	54	18						
39	37	33	12												
40	157	196	294	321	355	229	263	176	178	173	161	146	125	94	43
41	59	98	115	115	112	105	92	80	79	82	68	38			
AVERAGE	193	202	246	305	335	369	420	457	529	595	663	677	503	786	NA
INFLATN ADJ'D	292	297	351	422	450	482	532	562	631	690	746	739	534	809	NA

KANE REECE ASSOCIATES, INC.

EXHIBIT B

Cumulative Return Deficiency/(Surplus) by Calendar Year by System using 11.25% Regulated Rate of Return

- **Provides raw calculated ARD Values.**
- **Provides maximum ARD, year of initial data, and build date.**
- **Provides years to ARD break-even from both initial data and build dates.**
- **Provides years from data start and build dates to maximum ARD.**

ARD SUMMARY

EXHIBIT B

PG 1

System	($) 1993	MAX ARD ($)	MAX ARD ($) PER SUB @MAX YR	YEAR OF MAX ARD	YEAR OF INITIAL DATA	YEAR OF SYSTEM BUILD	YEARS FROM BUILD TO MAX ARD	YEARS TO BREAKEVEN FROM BUILD DATE *
1	(4,909,247)	1,610,719	112	1986	1982	1982	4	8.4
2	40,438,336	40,438,336	521	1993	1981	1981	12	13.0
3	(1,061,702)	2,161,880	578	1988	1980	1980	8	12.9
4	35,033,695	35,033,695	744	1993	1985	1985	8	9.0
5	8,256,401	10,628,478	416	1988	1979	1979	9	15.0
6	12,296,712	12,296,712	1,294	1993	1979	1979	14	15.0
7	31,921,246	31,921,246	1,305	1993	1979	1979	14	15.0
8	3,748,218	5,769,534	416	1989	1982	1982	7	12.0
9	4,776,882	4,776,882	550	1993	1980	1980	13	14.0
10	35,555,375	35,555,375	1,479	1993	1981	1981	12	13.0
11	615,150	615,150	169	1993	1989	1989	4	5.0
12	16,530,749	17,409,925	428	1991	1982	1982	9	12.0
13	3,790,098	5,842,067	205	1989	1980	1980	9	14.0
14	14,270,264	18,900,737	460	1991	1980	1980	11	14.0
15	(23,652,465)	1,091,119	27	1982	1979	1972	10	13.1
16	(3,038,018)	12,419,355	248	1986	1979	1979	7	14.3
17	17,817,722	17,817,722	693	1993	1981	1981	12	13.0
18	18,850,555	19,816,005	486	1991	1978	1978	13	16.0
19	(2,126,046)	4,293,630	143	1989	1982	1982	7	11.3
20	30,742,872	30,742,872	768	1993	1982	1982	11	12.0
21	28,695,238	38,033,105	258	1991	1986	1986	5	8.0
22	(2,248,179)	417,454	140	1987	1983	1983	4	8.0
23	99,617,220	99,617,220	468	1993	1987	1987	6	7.0
24	198,462,520	198,462,520	1,543	1993	1982	1982	11	12.0
25	(18,366,461)	596,853	45	1981	1981	1966	15	19.0
26	47,548,558	47,548,558	828	1993	1986	1986	7	8.0
27	19,584,078	19,928,169	408	1992	1985	1983	9	11.0
28	841,638	841,638	749	1993	1989	1989	4	5.0
29	38,009,870	38,009,870	493	1993	1986	1986	7	8.0
30	(4,104,292)	2,340,616	145	1985	1977	1976	9	13.8
31	(1,415,074)	492,819	183	1985	1981	1981	4	9.2
32	(585,802)	423,256	151	1986	1981	1981	5	9.8
33	(20,139,585)	990,847	77	1981	1979	1979	2	6.7
34	(10,872,737)	1,193,466	313	1981	1979	1975	6	11.8
35	1,293,700	5,531,656	157	1989	1984	1968	21	26.0
36	213,131,290	213,131,290	3,667	1993	1982	1982	11	12.0
37	(10,967,894)	6,071,051	150	1985	1979	1975	10	15.0
38	(32,339,710)	937,611	97	1973	1971	1967	6	13.4
39	(115,118,409)	613,282	37	1971	1971	1967	4	7.6
40	(76,589,744)	8,486,657	161	1982	1971	1952	30	35.5
41	(14,409,380)	1,344,394	105	1980	1975	1971	9	16.0
TOTAL	579,883,639	994,153,772						
AVG	14,143,503	14,143,503	518		1981	1979	9.2	12.6

* SYSTEMS THAT HAVE NOT YET REACHED BREAKEVEN ARE LISTED AT A 1994 DATE; THUS AVG DURATION IS CONSERVATIVE.

KANE REECE ASSOCIATES, INC.

EXHIBIT B

PG 2

($)

ARD ACCUMULATED RETURN DEFICIENCY STUDY
CUMULATIVE RETURN DEFICIENCY/(SURPLUS) BY YEAR BY SYSTEM

System	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
1	447,084	268,120	808,674	1,271,685	1,610,719	1,448,304	998,060	341,333				
2	269,180	6,123,553	8,237,829	11,482,971	14,994,865	17,752,631	21,028,571	24,726,278	28,640,026	32493267	36,184,047	40,438,336
3	1,026,957	1,318,812	1,491,219	1,700,902	1,900,780	2,076,520	2,161,880	1,697,594	1,276,109	705670		
4				2,661,384	8,429,939	13,830,721	18,039,021	22,033,437	25,642,327	28733962	32,402,922	35,033,695
5	3,172,959	4,728,470	6,111,214	7,465,670	8,744,534	9,735,408	10,628,478	10,236,155	10,452,967	10252711	9,342,989	8,256,401
6	2,181,474	3,209,104	4,106,909	5,091,998	6,235,110	7,402,653	8,541,408	9,127,790	9,998,364	10856386	11,711,202	12,296,712
7	4,222,672	6,580,881	9,260,778	11,655,621	14,218,027	17,041,250	19,689,438	23,402,959	25,467,907	27588455	29,698,526	31,921,246
8	430,977	1,414,970	2,619,323	3,790,236	4,423,456	5,056,373	5,574,645	5,769,534	5,579,667	5162331	4,550,055	3,748,218
9	1,535,774	2,160,876	2,574,960	2,946,591	3,407,776	3,811,981	4,145,586	4,413,959	4,613,072	4678131	4,769,440	4,776,882
10	1,922,233	5,399,100	8,732,718	11,368,609	14,077,486	16,863,091	19,668,769	22,888,188	25,849,236	28938648	32,255,612	35,555,375
11								51,625	95,568	271147	463,853	615,150
12	227,208	823,507	2,460,011	4,853,460	7,851,778	10,522,185	12,671,371	14,611,703	16,457,046	17409925	17,344,459	16,530,749
13	1,673,222	2,506,160	3,269,059	4,377,761	4,688,884	5,354,425	5,701,036	5,842,067	5,418,016	4492049	4,457,404	3,790,098
14	2,558,869	4,636,481	7,321,085	10,694,530	13,017,715	15,133,851	17,871,661	18,900,737	18,895,630	18239863	16,948,772	14,270,264
15	1,091,119	746,155	178,533									
16	6,696,221	9,041,430	10,739,608	12,291,162	12,419,355	12,086,798	11,227,849	9,575,406	7,613,034	4851765	1,507,486	
17	524,428	1,811,837	3,308,008	4,643,314	6,058,722	7,454,658	8,783,648	10,393,845	12,061,417	13918423	15,872,113	17,817,722
18	4,301,242	7,325,416	10,664,708	12,721,193	14,789,504	16,720,333	18,065,683	19,021,058	19,715,490	19816005	19,362,720	18,850,555
19	13,319	56,475	714,489	1,820,480	2,606,630	3,376,825	4,033,917	4,293,630	4,051,265	3066444	834,769	
20	239,777	2,387,797	5,687,870	10,133,344	13,391,363	16,763,597	20,277,581	23,278,510	26,274,069	28552508	30,002,552	30,742,872
21					455,589	5,882,664	16,197,282	25,788,871	33,329,723	38033105	35,054,661	28,695,238
22		33,755	92,551	176,501	364,935	417,454	381,905	254,498	18,548			
23						495,272	5,367,251	14,905,820	28,913,785	49257976	75,433,978	99,617,220
24	409,688	5,758,146	18,241,297	38,572,913	58,511,378	78,197,630	97,780,980	116,587,641	137,219,823	157875980	179,360,533	198,462,520
25	378,254	293,170										
26					342,579	2,278,705	6,676,541	12,560,616	20,077,119	29715001	38,785,735	47,548,558
27				1,790,972	5,708,759	9,574,027	12,680,173	15,249,255	17,668,444	19059120	19,928,169	19,584,078
28								32,753	173,535	407001	637,231	841,638
29					188,594	1,892,492	6,568,867	12,020,905	20,518,991	28658796	33,720,491	38,009,870
30	1,612,381	1,841,988	1,994,355	2,340,616	2,131,903	1,481,556	574,579					
31	230,390	403,587	457,173	492,819	488,849	409,303	278,500	65,342				
32	162,193	266,414	348,449	416,833	423,256	368,643	286,599	153,749				
33	990,847	770,436	312,884									
34	1,057,854	992,105	734,982	444,842	231,085							
35			1,198,180	2,620,558	3,239,935	4,159,679	5,104,067	5,531,656	4,939,420	3462116	2,171,115	1,293,700
36	881,855	12,259,107	26,515,107	42,802,757	60,511,727	79,514,416	100,119,685	121,349,105	142,963,956	164666782	187,945,570	213,131,290
37	4,616,748	5,191,019	5,797,760	6,071,051	6,066,357	5,074,247	4,110,683	2,192,664				
38												
39												
40	8,486,657	8,270,539	7,468,674	5,904,958	2,709,737							
41	1,181,991	1,240,593	1,299,436	1,104,359	662,276							
TOTAL	52,543,575	97,860,000	152,747,842	223,710,091	294,903,599	372,177,690	465,435,714	557,298,680	653,924,554	751,165,569	840,746,403	921,828,385
AVG	1,811,847	3,262,000	5,091,595	7,457,003	8,936,473	12,005,732	15,014,055	17,415,584	23,354,448	27,820,947	32,336,400	38,409,516

KANE REECE ASSOCIATES, INC.

EXHIBIT B

PG 3

ARD ACCUMULATED RETURN DEFICIENCY STUDY
CUMULATIVE RETURN DEFICIENCY/(SURPLUS) BY YEAR BY SYSTEM

($)

System	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
1											
2											137,942
3										472,141	724,992
4											
5									30,706	588,889	1,516,556
6									3,120	407,803	1,159,278
7									127,058	1,018,370	1,926,400
8											
9										281,238	873,299
10											121,380
11											
12											
13										88,766	766,093
14										188,431	625,023
15									203,543	342,567	809,406
16									1,113,480	2,706,777	4,720,689
17											28,491
18								145,643	350,365	258,158	1,726,609
19											
20											
21											
22											
23											
24											
25											596,853
26											
27											
28											
29											
30							332,268	686,936	1,038,047	1,243,076	1,273,809
31											88,329
32											63,784
33									528,686	832,860	980,552
34									1,053,133	1,145,917	1,193,466
35											
36											
37									2,265,144	2,973,569	3,755,546
38	737,721	916,444	937,611	935,017	936,497	880,595	771,759	604,034	205,533		
39	613,282	605,013	293,632								
40	1,222,175	1,991,611	2,801,793	3,549,748	4,050,792	4,615,450	5,592,413	6,629,126	7,694,766	8,062,681	8,066,298
41					472,215	862,012	1,136,676	1,257,448	1,316,968	1,344,394	1,261,422
TOTAL	2,573,178	3,513,068	4,033,036	4,484,765	5,459,504	6,358,057	7,833,116	9,323,187	15,930,748	21,955,637	32,416,218
AVG	857,726	1,171,023	1,344,345	2,242,383	1,819,835	2,119,352	1,958,279	1,864,637	1,225,442	1,372,227	1,473,464

KANE REECE ASSOCIATES, INC.

EXHIBIT C

Cumulative ARD Per Basic Subscriber by Calendar Year by System

- **The ARD analysis continues until cumulative break-even is achieved.**
- **Per subscriber ARD values approach $736 consistent with the maximum ARD per subscriber value.**